

In the Claims:

Please amend the claims as indicated hereafter.

1. (Currently Amended) A spectral correlator, comprising:

a specimen; and

an optical device configured to collect light from the specimen and to optically determine a similarity of a received first spectra of the light collected from the first spectra and a second known spectra by directly comparing the light to a representation of the second known spectra.

2. (Original) The spectral correlator of claim 1, wherein the optical device is further configured to output a signal indicative of the similarity.

3. (Original) The spectral correlator of claim 2, further comprising a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the second known spectra, is present in the specimen.

4. (Original) The spectral correlator of claim 3, wherein the optical device comprises a first lens configured to perform a Fourier transform on the received first spectra.

5. (Original) The spectral correlator of claim 4, further comprising a spatial filter containing the Fourier transform of the second known spectra.

6. (Original) The spectral correlator of claim 5, wherein the first lens transmits a signal indicative of the Fourier transform of the received first spectra to the spatial filter.

7. (Original) The spectral correlator of claim 6, further comprising a second lens configured to receive a second signal from the spatial filter and transmit a signal indicative of the similarity of the received first spectra and the known spectra onto the detection device.

8. (Original) The spectral correlator of claim 7, wherein the specimen is in direct proximity to the optical device.

9. (Original) The spectral correlator of claim 7, wherein the specimen is remote from the optical device.

10. (Currently Amended) The spectral correlator of claim 9, wherein the spatial filter, the first lens, and the second lens are arranged such that a variation with time of the similarity signal is a representation of the variation as a function of distance of a concentration of the specimen indicated by the second known spectra.

11. (Currently Amended) The spectral correlator of claim 4, further comprising a spatial filter, wherein the spatial filter contains [[a]] the representation of the second known spectra.

12. (Original) The spectral correlator of claim 11, wherein the first lens transmits a signal indicative of the Fourier transform of the received first spectra to the spatial filter.

13. (Original) The spectral correlator of claim 12, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the representation of the known spectra.

14. (Original) The spectral correlator of claim 13, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received first spectra and the known spectra onto a detection device.

15. (Original) The spectral correlator of claim 14, wherein the specimen is in direct proximity to the correlator.

16. (Original) The spectral correlator of claim 14, wherein the specimen is remote from the optical device.

17. (Currently Amended) The spectral correlator of claim 16, wherein the spatial filter, the first lens, and the second lens are arranged such that the variation with time of the similarity signal is a representation of the variation as a function of distance of the concentration of the specimen indicated by the second known spectra.

18. (Currently Amended) A spectral correlator, comprising:
- a specimen;
- an illuminating device configured to illuminate the specimen; and
- an optical device configured to optically determine the similarity of a received ~~first~~ spectra resulting from the illumination of the specimen and a ~~second~~ known spectra.
19. (Original) The spectral correlator of claim 18, wherein the optical device is further configured to output a signal indicative of the similarity.
20. (Currently Amended) The spectral correlator of claim 19, further comprising a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the ~~second~~ known spectra, is present in the specimen.
21. (Currently Amended) The spectral correlator of claim 20, wherein the optical device comprises a first lens configured to perform a Fourier transform on the received ~~first~~ spectra.
22. (Currently Amended) The spectral correlator of claim 21, further comprising a spatial filter, wherein the spatial filter contains the Fourier transform of the ~~second~~ known spectra.

23. (Currently Amended) The spectral correlator of claim 22, wherein the first lens transmits a signal indicative of the Fourier transform of the received ~~first~~ spectra to the spatial filter.

24. (Original) The spectral correlator of claim 23, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the Fourier transform of the known spectra.

25. (Currently Amended) The spectral correlator of claim 24, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received ~~first~~ spectra and the known spectra onto a detection device.

26. (Currently Amended) [[A]] The spectral correlator of claim 25, wherein the received ~~first~~ spectra is a Raman spectra resulting from the illuminating device illuminating the specimen and the ~~second~~ known spectra is a known Raman spectra.

27. (Canceled)

28. (Currently Amended) The spectral correlator of claim [[24]] 22, wherein the spatial filter contains a representation of the ~~second~~ known spectra.

29. (Currently Amended) The spectral correlator of claim 28, wherein the first lens transmits a signal indicative of the Fourier transform of the received ~~first~~ spectra to the spatial filter.

30. (Original) The spectral correlator of claim 29, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the representation of the known spectra.

31. (Currently Amended) The spectral correlator of claim 30, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received ~~first~~ spectra and the known spectra onto a detection device.

32. (Currently Amended) [[A]] The spectral correlator of claim 31, wherein the received ~~first~~ spectra is a Raman spectra resulting from the illuminating device illuminating the specimen and the ~~second~~ known spectra is a known Raman spectra.

33. (Currently Amended) The spectral correlator of claim 32, wherein the spatial filter, the first lens, and the second lens are arranged such that the variation with time of the similarity signal is a representation of the variation as a function of distance of the concentration of the specimen indicated by the second known spectra.

34. (Currently Amended) A spectral correlator, comprising:
a specimen;
means for receiving light reflected off and/or emitted by the specimen; and
means for optically correlating the light received to determine the similarity of the spectra of the received light from the specimen and a second known spectra, the correlating means having an optical filter for filtering the light, the optical filter indicative of the second known spectra such that the filtered light has an intensity indicative of the degree to which the spectra of the received light and the second known spectra are similar.

35. (Currently Amended) A spectral correlation method, comprising the steps of:
receiving ~~a first spectra corresponding to~~ light from a specimen;
optically performing a first Fourier transform on [[the]] a first spectra of the light as the light is passing through [[via]] a first lens to obtain a transformed first spectra;
optically multiplying the transformed first spectra with a representation of a known spectra to obtain a similarity signal; [[and]]
focusing, via a second lens, the similarity signal on a detector;

providing an indication as to whether at least one substance is present in the specimen based on the similarity signal.

36. (Currently Amended) The method of claim 35, wherein the representation of the first known spectra is a Fourier transform of the known spectra.

37. (Original) The method of claim 35, wherein the performing step, the multiplying step and the focusing step are optically performed via an optical device.

38. (Currently Amended) The method of claim [[35]] 37, wherein the specimen is remotely located from the optical device.

39. (Currently Amended) The method of claim [[35]] 37, wherein the specimen is housed proximate to the optical device.

40. (Original) The method of claim 35, wherein the first spectra is a Raman spectra, and the known spectra is a Raman spectra.

41. (Currently Amended) The method of claim 40, wherein the performing and multiplying steps are performed such that a variation with time of the similarity signal is a representation of the variation as a function of distance of the concentration of the specimen indicated by the known spectra.

42. (Currently Amended) A spectral correlation method, comprising the steps of:
receiving ~~a first spectra corresponding to~~ light from a specimen;
separating [[the]] a first spectra of the light into its component colors;
optically multiplying the separated first spectra with a representation of a known second
spectra to obtain a similarity an optical signal indicative of the degree to which the first spectra and
the known second spectra are similar; and
detecting the similarity optical signal.
43. (New) The method of claim 42, further comprising the steps of:
measuring an intensity of the optical signal;
comparing a value indicative of the measured intensity to a threshold; and
providing an indication as to whether at least one substance is present in the specimen based
on the comparing step.
44. (New) The method of claim 42, further comprising the step of providing an indication
as to whether at least one substance is present in the specimen based on the optical signal.

45. (New) A spectral correlation method, comprising the steps of:
receiving light from a specimen;
filtering the light with an optical filter indicative of a known spectra corresponding to at least one substance such that a spectra of the light is optically multiplied depending on a similarity between the spectra of the light and the known spectra;
determining whether the at least one substance is present in the specimen based on the filtered spectra; and
providing an indication as to whether the at least one substance is present in the specimen based on the determining step.
46. (New) The method of claim 45, wherein the filtering step comprises the step of performing an analog multiplication of a Fourier transform of the spectra of the light with a Fourier transform of the known spectra.
47. (New) The method of claim 46, further comprising the step of performing a Fourier transform on the spectra of the light as the spectra of the light is passing through a first lens.
48. (New) The method of claim 47, further comprising the step of performing an inverse Fourier transform on the filtered spectra as the filtered spectra is passing through a second lens.

49. (New) The method of claim 45, wherein the filtered spectra has an intensity indicative of a degree to which the spectra of the light and the known spectra are similar, and wherein the method further comprises the steps of:

converting the filtered spectra from an optical signal to an electrical signal; and

measuring the intensity of the filtered spectra based on the electrical signal.

50. (New) The method of claim 49, further comprising the step of comparing a value indicative of the measured intensity to a threshold, wherein the determining step is based on the comparing step.

51. (New) The spectral correlator of claim 18, wherein the optical device is further configured to filter light from the specimen using an optical filter indicative of the known spectra and to determine, based on the filtered light, the similarity of the received spectra defined by the light and the known spectra.